Abstract

James Peebles’ insights that 1) the cosmic background photons play a critical role in the formation of galaxies and their anisotropies are sensitive to cosmological parameters, 2) dark matter particles have small velocity dispersion (cold), and 3) the cosmological constant $\Lambda$ is comparable to matter energy density today, form the foundation of the standard cosmological model, which is spectacularly successful in accounting for most of the observational data. In this so-called $\Lambda$CDM model, the universe is dominated by dark energy and dark matter, both of which remain mysterious and require new physics. I will give an elementary introduction of the $\Lambda$CDM model and some of the observational evidences supporting it. I will also discuss some outstanding problems of the model and related researches at CUHK.